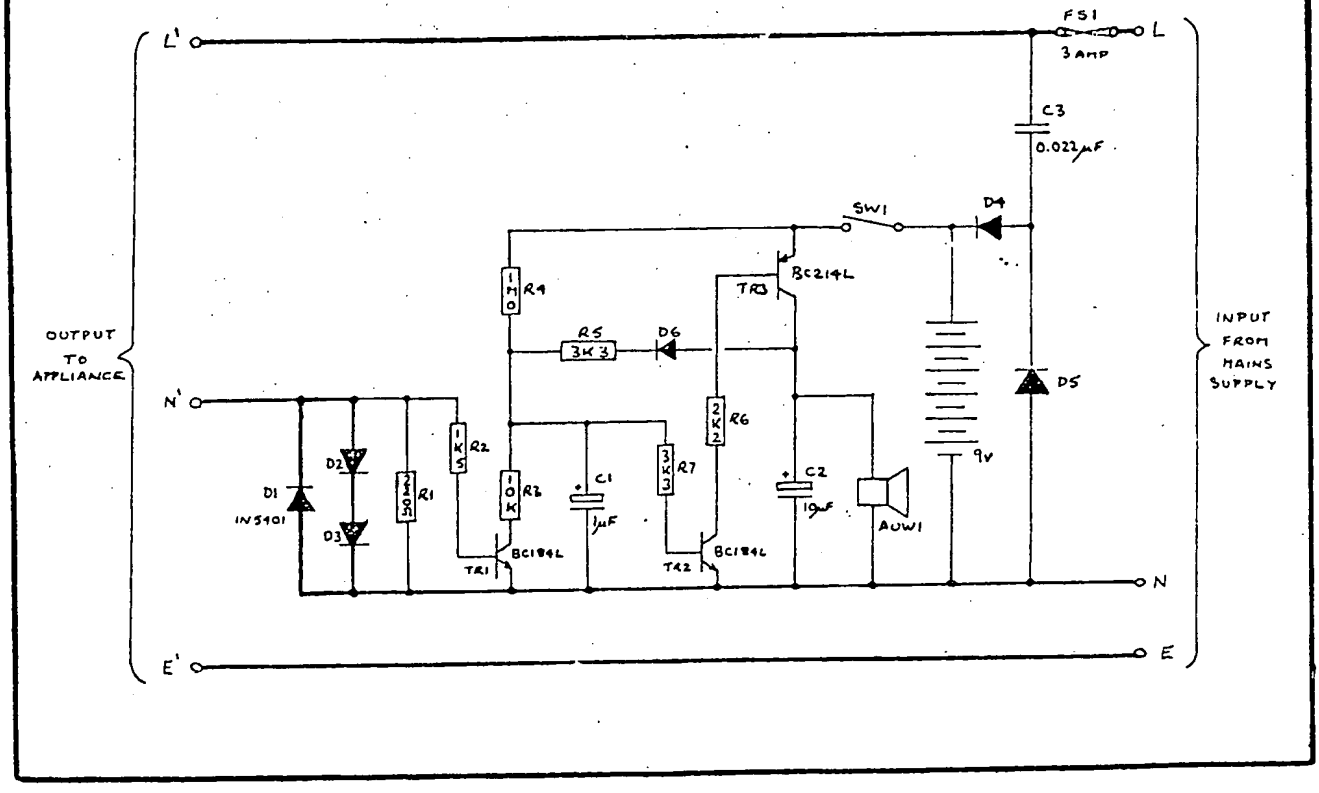
(12) UK Patent Application (19) GB (11) 2 124 422 A

(21) Application No. **8313164**
(22) Date of filing **13 May 1983**
(30) Priority data
(31) **8214028**
(32) **14 May 1982**
(33) **United Kingdom (GB)**
(43) Application published
15 Feb 1984
(51) **INT CL³**
G08B 13/14
(52) Domestic classification
G4N 1X 2B 4S 5A 6B1 CA
U1S 2188 G4N
(56) Documents cited
GB 1537790
GB 1128267
(58) Field of search
G4N
(71) Applicant
Alan Johnson,
7 Beechwood Glade,
Foxwood,
York,
YO2 3JT
(72) Inventors
Alan Johnson,
Peter Graham Long
(74) Agent and/or address for service
Alan Johnson,
7 Beechwood Glade,
Foxwood,
York,
YO2 3JT

(54) Theft alarms

(57) An alarm device designed to protect video recorders and other electrical apparatus having a permanent current under normal conditions by utilising this permanent current, such as the clock display current of a video recorder, to permanently charge a rechargeable battery and in the event of the mains supply being disconnected from the electrical apparatus, the device will transfer the fully charged battery on to an alarm sounder, the device can be built into a single unit, a multiple unit, or the permanent wiring of the electrical apparatus at manufacture.

FIG 1



GB 2 124 422 A

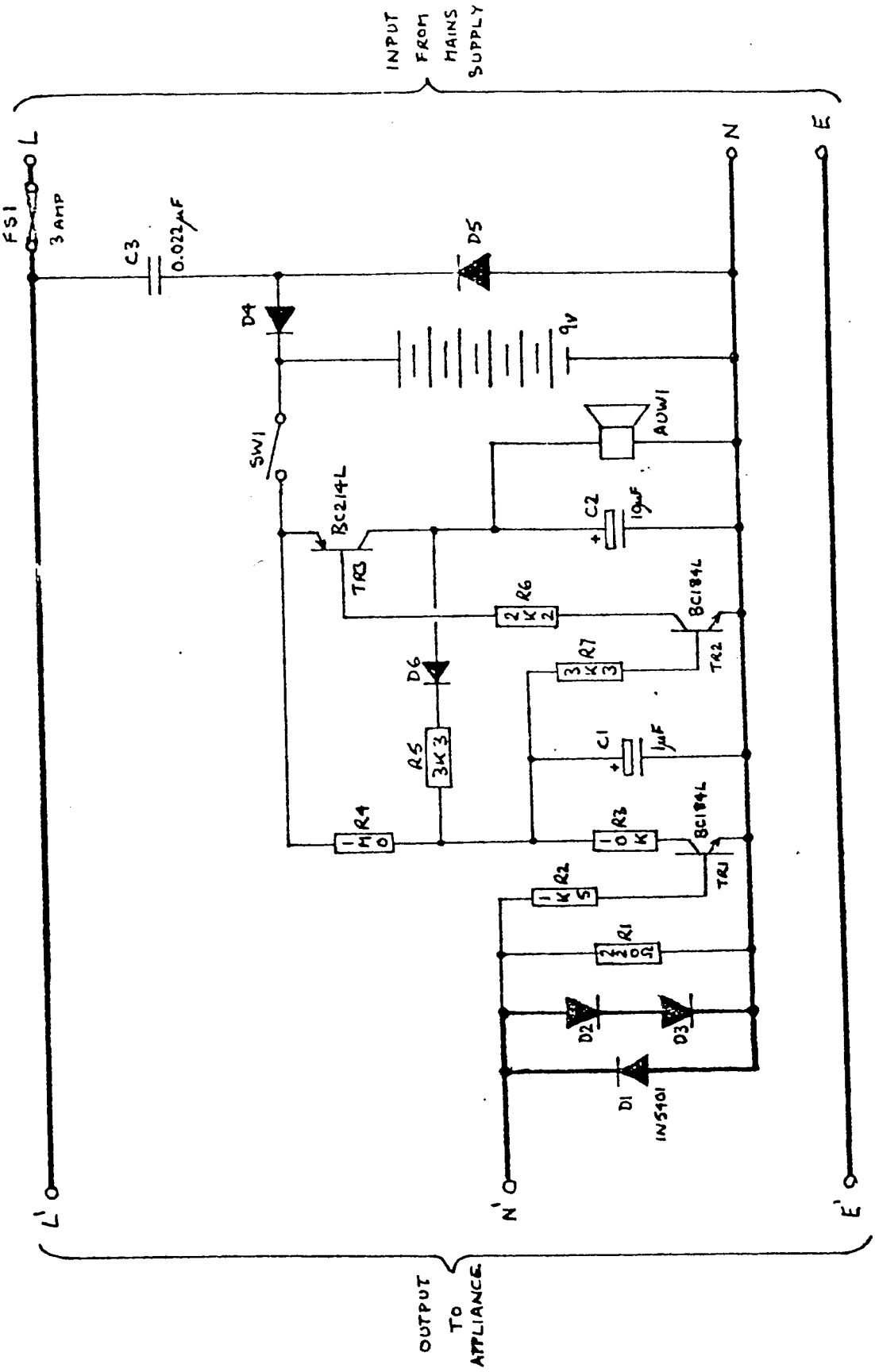

INPUT FROM MAINS SUPPLY
L
N
E
FS1
3 AMP
C3
0.022μF
D5
D4
9V
SW1
AUW1
BC214L
TR3
C2
10μF
R6
2K2
BC184L
TR2
R7
3K3
D6
R5
3K3
C1
1μF
R4
10K
R3
10K
BC184L
TR1
R2
1K5
R1
220Ω
D2
D3
D1
IN5401
L'
N'
E'
OUTPUT TO APPLIANCE

FIG 1

SPECIFICATION

A security device

The present invention relates to an alarm device having as its basic object the provision of a means for causing an alarm to be activated upon the removal of an electrical apparatus having a permanent current present, from its mains supply. With the ever increasing number of thefts of video recorders, television receivers and other costly appliances, the need for providing alarm devices to prevent such thefts has become acute. Such need has heretofore been met by the provision of numerous different types of alarm devices which, while they do actuate an alarm upon removal of the electrical apparatus, have not provided to be entirely satisfactory.

Whereas the majority of existing alarm devices utilises a mains-fail system of operation, the present invention utilises the permanent display current of such electrical apparatus as video recorders to provide permanent charging of a standby-battery, and on disconnection of the mains supply, the switch of this battery to actuate an alarm. Fig. I shows the complete electrical circuit arrangement of the present invention and its operation is as follows:—

It is designed to detect when the low current drawn by an appliance such as a video tape recorded in stand-by mode with only the digital clock operating is disconnected from the mains supply. However the circuit can also withstand larger currents, up to the fuse rating, which is chosen to be just less than the continuous forward current allowed for the sensing diodes (D1—D3).

The applicance current flows from the L terminal of the mains supply (right) through the fuse (FS1) and across to the L terminal for the appliance. The current returns from the appliance from the N terminal, through diodes D2 and D3 and across to the mains supply terminal N. Because the mains supply provides an alternating current the current direction reverses every 10 milliseconds and therefore diode D1 carries the reverse component.

For the following description assume that the switch SW1 is closed and the 9 volt rechargeable battery is fully charged. During the current's positive half cycle, a voltage of approximately 1.3 volts is developed across D2 and D3. A small current flows through R2 into the base of transistor TR1 and turns it on. Therefore, during this time, current flows down through R4 and R3 and because R3≪R4, the capacitor C1 remains discharged. During the negative cycle the capacitor only charges fractionally and therefore the transistor TR2 is not allowed to turn on as the base emitter threshold voltage is not exceeded. The transistor TR3 is also off because no base current can flow through R6 and TR2. No voltage is applied to the piezoelectric sounder AUWI because TR3 is off and therefore no current flows through R5 and D6 as this diode is reverse biased.

The circuitry is supplied through switch SW1 from a rechargeable battery so that power is available to feed the piezoelectric sounder even if the mains supply is removed. The capacitor C3 represents a high impedance to the mains supply and only allows a very small current to flow into the battery through the diode D4 during the positive half cycle. This current is less than the maximum trickle current allowed for the battery and therefore continuous charging occurs when the mains supply is available even if the switch SW1 is turned off.

If the appliance current disappears either due to the removal of the appliance or the whole arrangement from the supply, then the base of transistor TR1 is no longer supplied with current. No current flows in resistor R3, and the capacitor C1 charges up with current coming from the 9 volt supply via resistor R4. As soon as the voltage on the capacitor reaches the base emitter threshold voltage of TR2 (0.6 volts) this transistor starts to turn on. Current now starts to flow through the base of PNP transistor TR3 and resistor R6. As TR3 turns on, the voltage across the sounder AUW1 and the capacitor C2 rises. After it has reached approximately 1.3 volts current flows through the diode D6 and resistor R5 to reinforce the current coming down from the supply through resistor R4. Because R5≪R4 the transistors turn on rapidly, supplying almost the full battery voltage to the sounder.

Even if the appliance current is re-established and transistor TR1 is turned on, the current through resistor R3 will be insufficient to drain the base current from transistor TR2 and therefore the sounder will continue to create a sound. Only by turning off the switch SW1 can the circuit be re-set.

An additional circuit could be added to make the sounder produce a pulsed tone if such a tone might be more noticeable than a continuous sound.

The present invention can be incorporated into a single or multiple unit, or incorporated in the permanent wiring of the electrical apparatus at manufacture.

Claims

1. A device for giving an alarm when connected to an electrical apparatus having a permanent current is disconnected from the mainu power supply and an alarm will automatically sound.

2. A device according to claim 1 wherein the means for providing the monitoring current is energised from the electrical apparatus.

3. A device according to claim 2 adapted to include a battery for providing the monitoring current when the electrical supply to the socket fails.

4. A device according to claim 1, 2 or 3, wherein the alarm means is battery operated.

5. A device for giving an alarm when electrical

apparatus having a permanent current present is removed from the mains supply, substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1984. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.